

## CLAIMS

What is claimed is:

1. A field effect transistor, comprising:
  - a) a channel;
  - b) an undercut area under the channel;
  - c) a gate electrode disposed over the channel; and
  - d) a compressive film in the undercut area, wherein the compressive thin film creates longitudinal stress in an area of the channel under the gate electrode.
2. The transistor of claim 1 wherein the transistor is a PFET, and an upper portion of the channel is under longitudinal compressive stress.
3. The transistor of claim 1 wherein the transistor is a NFET, and an upper portion of the channel is under longitudinal tensile stress.
4. The transistor of claim 1, wherein the transistor is a PFET, and the undercut area is disposed under an end of the channel.
5. The transistor of claim 1, wherein the transistor is a NFET, and the undercut area is disposed under a middle portion of the channel.
6. The transistor of claim 1 wherein the transistor is a PFET, and the transistor comprises an undercut area under a source, and an undercut area under a drain.
7. The transistor of claim 1 wherein the compressive film is made of a material selected from the group consisting of oxidized polysilicon, oxidized amorphous silicon, silicon nitride, oxidized SiGe, and thermal silicon dioxide.

- 1 8. A method for making a field effect transistor with a current channel with  
2 longitudinal stress, comprising the steps of:  
3 a) forming an undercut area under the channel; and  
4 b) forming a compressive film in the undercut area so that longitudinal stress  
5 is created in the channel.
- 1 9. The method of claim 8 wherein the undercut area is located at an end of the  
2 channel.
- 1 10. The method of claim 8 wherein the undercut area is located under a middle  
2 portion of the channel.
- 1 11. The method of claim 10 wherein the channel is released in the middle portion.
- 1 12. The method of claim 8 wherein the undercut area is created by etching a buried  
2 oxide layer from under the channel.
- 1 13. The method of claim 8 wherein the compressive film is formed by depositing  
2 polysilicon and then oxidizing the polysilicon.
- 1 14. A field effect transistor, comprising:  
2 a) a buried oxide layer;  
3 b) a channel disposed on the buried oxide layer;  
4 c) an undercut area under the channel;  
5 d) a gate electrode disposed over the channel; and  
6 e) a compressive film in the undercut area, wherein the compressive thin film  
7 creates longitudinal stress in an area of the channel under the gate  
8 electrode.

1           15.     The transistor of claim 14 wherein the undercut area is an area of etched buried  
2                   oxide material.